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4/6(N.E.)

29 December 2003

Crystal J. Barnes
Examiner
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313

RE: Application Number 09/771,799

Dear Ms Barnes:

Thank your for your consideration regarding patent application 09/771,799. In review of your comments, it is clear that you discovered application inconsistencies. Your efforts are appreciated in discovering these inconsistencies. I trust the amendments enclosed clarify and correct those inconsistencies.

Again, after review of your comments regarding the application claims, I now have a better understanding of the USPTO requirements. I have reworked the claims for your review. Because I am a practicing mechanical / control engineer, patent law is not an area I consider a specialty and request a meeting with you to discuss the patent application and specifically the claim construction. As circumstances occur, I am temporarily local to the area while overseeing the building a pharmaceutical plant and may be reached at:

(301)963-1719

Please continue to send official correspondence to the address on record.

I have also included the Detailed Action Section of the Office Action along with my responses (as set off by text boxes and differing fonts). To address some of the comments, I have included a paper published by The Instrumentation, Systems, and Automation Society. This paper was awarded co-best paper at the Technology Exposition 2001, Houston, TX for its advancement of process control engineering. I trust these responses along with this paper will aid you in determining patentability of my application.

Thank you in advance for your assistance.

Sincerely

Robert H. Francis PE
President

Enclosures:
1 Detailed Action Section of the Office Action with Applicant Remarks
2 Amendment A
3 Francis, Robert H., "Asymptotic Approach Algorithm " ISA 2001 Technology Update, Volume LVI Part 1,The Instrumentation, Systems and Automation Society), Research Triangle Park NC, 2001, Page 111 to 120 along with USPTO form PTO/SB/08B.

In the United States Patent and Trademark Office

Application Number:	09/771,799
Application Filed:	29 January 2001
Applicant:	Robert Henry Francis
Title:	Process for Rapidly Controlling a Process Variable Without Overshoot Using a Time Domain Polynomial Feedback Controller
Examiner:	Crystal J. Barnes

Rockville, MD 29 December 2003

Amendment A

Assistant Commissioner for Patents
Alexandria, VA 22313

Sir:

In response to the Office Action mailed 3 October 2003, please amend the above application as follows:

Specification:
Paragraph 42 Delete current paragraph and replace as follows:

> Previous attempts have been made that use an asymptotic approach to setpoint, specifically Rae Richard, US Pat. No. 4,948,950 (incorporated herein as Rae). However, Rae's method uses a linear algebraic equation for development of the "... the target slope below the setpoint temperature or is the target rate of change of the temperature of the output heating effect of the heating means... ". Because the equation is a linear function, the process variable does not approach setpoint as quickly as if the equation incorporated an nth-order exponential term. Thus the control equation proposed by Rae wastes resources (e.g., time, energy, etc.) when applied to a system in which movement of the process variable to setpoint as rapidly as possible without overshoot is the key control method selection criteria.

Paragraph 70 Delete current paragraph and replace as follows:

> While not the only method, one method to integrate the error is show in Figure 2. At user defined intervals **40**, the current error signal **42** (and **15**) is "Pushed" or loaded into the first position of a Z element software stack **44**. At the same time, the Z^{th} element is "Popped" or unloaded from the stack and discarded **46**. The stack is summed and averaged as described above **48**. If integral correction is active **50** and the error is negative **22**, set each element of the previously defined software stack to 0 **51**.

Paragraph 72 Delete current paragraph and replace as follows:

> The next function of the controller is a user selectable method to improve the K_{bias} term. If the user has selected Automatic Bias Improvement **52**, the error signal **15** is checked against a user selected K_{bias_adj} **54** at the time point **38** that Integral Correction is initiated if used. If the error signal is greater than K_{bias_adj} **54** and positive, the new K_{bias_adj} is calculated as follows **60**:

$$K_{Bias\_New} = K_{Bias} + (\frac{Error}{2})$$

Paragraph 73 Delete current paragraph and replace as follows:

If the error signal is greater than K_{bias_adj}, 54 and negative 56, the new K_{bias_adj} is calculated as follows 58:

$$K_{bias} = K_{bias}+ABS(Error)+1 \text{ [where ABS is absolute value function]}$$

Drawings:
Cancel Figure 2 Asymptotic Approach Algorithm Flowchart and replace with the following **Figure 2: Asymptotic Approach Algorithm Flowchart**